

Claim 1 (currently amended): A method for the purification of plasmid DNA in an aqueous two-phase system, comprising: ~~the steps of~~

- (a) providing a composition ~~comprising~~ including a first polymer that exhibits inverse solubility characteristics, a second polymer that is immiscible in the first polymer and, optionally, a salt;
- (b) contacting said ~~solution~~ composition with an aqueous solution comprising plasmid DNA;
- (c) providing a phase separation and subsequently isolating the aqueous phase;
- (d) increasing the temperature of the isolated aqueous phase to a temperature above the cloud point of the first polymer and below ~~the~~ a temperature where plasmid DNA is degraded and subsequently isolating the aqueous phase so formed; and, optionally,
- (e) performing a chromatography step to recover the plasmid DNA from the isolated top phase.

Claim 2 (currently amended): ~~A method according to~~ The method of claim 1, wherein the first polymer has a cloud point below about 60°C in the aqueous solution.

Claim 3 (currently amended): ~~A method according to~~ The method of claim 1 ~~or 2~~, wherein the first polymer is selected from the group ~~that consists~~ consisting of polyalkylene glycols, poly(oxyalkylene)polymers, poly(oxyalkylene)copolymers, polyvinyl pyrrolidone, polyvinyl alcohol, polyvinyl caprolactam, polyvinyl methylether, alkoxyated surfactants, alkoxyated starches, alkoxyated cellulose,

alkyl hydroxyalkyl cellulose, silicone-modified polyethers, and poly N-isopropylacrylamide and copolymers thereof.

Claim 4 (currently amended): ~~A method according to any one of the preceding claims,~~  
The method of claim 1, wherein the first polymer is a copolymer ~~comprised of~~  
including ethylene oxide and propylene oxide, ~~preferably about 50% of ethylene~~  
~~oxide and about 50% of propylene oxide.~~

Claim 5 (currently amended): ~~A method according to any one of the preceding claims,~~  
The method of claim 1, wherein the second polymer is selected from the group that  
~~consists consisting of~~ hydroxyalkyl cellulose, hydroxyalkyl starches, starch, dextran,  
and pullulan.

Claim 6 (currently amended): ~~A method according to any one of the preceding claims,~~  
The method of claim 1, wherein the weight ratio of the amounts of first  
polymer:second polymer is about 1:1.

Claim 7 (currently amended): ~~A method according to~~ The method of claim 6, wherein  
the amount of the first polymer is about 4.5% (w/w) and the amount of the second  
polymer is about 4.5% (w/w) of the composition provided in step (a).

Claim 8 (currently amended): ~~A method according to any one of the preceding claims,~~  
The method of claim 1, wherein the aqueous solution that ~~comprises includes~~ plasmid  
DNA is a cell lysate, ~~which and wherein said method further~~ comprises a step for  
desalting the cell lysate before step (b).

Claim 9 (currently amended): ~~A method according to any one of the preceding claims,~~  
The method of claim 1, wherein the contacting according to step (b) involves mixing  
at room temperature.

Claim 10 (currently amended): ~~A method according to any one of the preceding~~  
~~claims,~~ The method of claim 1, wherein the isolation according to step (c) and/or step  
(d) is by centrifugation.

Claim 11 (original): A composition for extraction of plasmid DNA in an aqueous two-  
phase system, which composition comprises a first polymer that exhibits inverse  
solubility characteristics at temperatures below about 60°C, a second polymer that is  
immiscible in the first polymer and optionally a salt.

Claim 12 (currently amended): ~~A composition according to~~ The composition of claim  
11, wherein the amount of the first polymer is 4.5% (w/w) and the amount of the  
second polymer is 4.5% (w/w).

Claim 13 (cancelled)

Claim 14 (original): A kit for purification of plasmid DNA from a cell lysate in an  
aqueous two-phase system, which kit comprises a first polymer that exhibits inverse  
solubility characteristics at temperatures below about 60°C, a second polymer that is  
immiscible in the first polymer and optionally a salt in one compartment as well as  
written instructions for the use thereof.

Claim 15 (currently amended): ~~A kit according to~~ The kit of claim 14, wherein the first polymer is comprised of ethylene oxide and propylene oxide.

Claim 16 (currently amended): ~~A kit according to~~ The kit of claim 14 ~~or 15~~, wherein the second polymer is selected from the group ~~that consists~~ consisting of hydroxyalkyl cellulose, hydroxyalkyl starches, starch, dextran, and pullulan.

Claim 17 (currently amended): ~~A kit according to any one of claims 14-16,~~ The kit of claim 14, wherein the weight ratio of the amounts of first polymer:second polymer is about 1:1.

Claim 18 (currently amended): ~~A kit according to any one of claims 14-17,~~ The kit of claim 14, which is for purification of a cell lysate that has been desalted before being mixed with an aqueous solution that comprises plasmid DNA.

Claim 19 (cancelled)

Claim 20 (currently amended): ~~Use~~ The use of a polymer that exhibits inverse solubility characteristics at temperatures below about 60°C in an aqueous two-phase system for the purification of plasmid DNA from a cell lysate.

Claim 21 (currently amended): ~~Use according to~~ The use of claim 20, wherein the polymer is a copolymer of ethylene oxide and propylene oxide.

Claim 22 (new): The method of claim 4, wherein the copolymer includes about 50% propylene oxide and about 50% ethylene oxide.